

*Plan 2009
→ 2013*

*Strategic action plan
for improving safety
in commercial air transport*

Ressources, territoires et habitats
Énergie et climat Développement durable
Prévention des risques Infrastructures, transports et mer

**Présent
pour
l'avenir**



Direction générale de l'Aviation civile
Direction de la sécurité de l'Aviation civile



*Plan 2009
→ 2013*

***Strategic action plan
for improving safety***

in commercial air transport

Contents

Foreword	5
Introduction.....	6
Purposes of the SSP.....	8
Reducing general risks.....	10
Reducing specific risks.....	14
Risk portfolio for the commercial air transport industry.....	16

Foreword

The aviation community recognizes that the desired improvements in air transport safety require all those involved to develop and improve their methods of managing safety. As a result, operators have begun to implement Safety Management Systems (SMS). For this to be effective, the State has to integrate its regulatory, oversight and safety promotion duties into a similar management system known as a State Safety Programme (SSP).

The aims of the SSP are to improve risk evaluation and analysis, set safety objectives for reducing these risks, define action plans to achieve these objectives and create indicators to monitor their effectiveness. One of the innovative actions performed under the SSP is the drawing up of a strategic safety improvement plan and its associated risk portfolio. The SSP allows the State to concentrate its energies on providing continuous and effective improvement in commercial aviation safety.

This document was prepared after the careful consideration of all the incident and accident data available to us and by compiling the analyses and activities of other bodies. It also incorporates other less factual information based on expert advice and therefore must not be considered to be a definitive document; on the contrary, we intend to produce future versions.

The SSP requires us to enter into positive discussions with operators on subjects such as identifying major risks, defining safety objectives associated with these risks, defining national safety indicators which are pertinent to the risks, and designing and implementing safety improvement action plans. It is for this reason that I have made sure that this strategic plan is to be widely distributed, and indeed in the public domain. The French Civil Aviation Authority (DGAC) will examine with the utmost attention any proposals for the plan's future development.

As for implementing this strategic plan within the DGAC, I have asked our departments to prepare and commit themselves to a detailed action plan which shall include specific actions and deadlines. Despite this being for internal DGAC use, and subject to frequent change, I have nevertheless decided to make it public. The version dated 1st January 2009 can be found in the Appendix to this document. The current detailed action plan, along with the strategic plan itself, is available from the DGAC website in the section entitled "Grands Dossiers, Sécurité" (Major Issues: Safety).

Director General of the French Civil Aviation Authority
Patrick Gandil

“ One of the innovative actions performed under the SSP is the drawing up of a strategic safety improvement plan ”

Introduction

According to the International Civil Aviation Organization (ICAO), a **safe situation** is one where the risk of harm to persons or of property damage is reduced to, and maintained at or below, an acceptable level through a continuing process of hazard identification and risk management.

In addition, the ICAO advocates the idea of an “acceptable level of safety” instead of an unrealistic «zero-tolerance» level of safety for air transport; indeed, the aim should be for continuous improvement through risk management and technical progress.

Passenger requirements in terms of destinations, punctuality and cost as well as more general economic, social or political concerns are just some of the factors that have a direct effect on levels of safety.

By integrating its regulatory, oversight and safety promotion roles the French State finds itself confronted with a similar situation to the operators when it comes to optimizing safety levels within the industry. All these considerations shall have to be taken into account when setting acceptable levels that comply with the ICAO's definition of safety.

Data contained in the 2006 and 2007 safety reports published by the French ministry responsible for civil aviation show that national

10-year averages for fatal accidents involving aircraft with more than 19 seats are greater for France than for some other major European countries.

The principal aim of the State Safety Programme (SSP) is to ensure that the French safety level is equivalent to that of the safest European countries.

The above indicator, which is partly representative of this level of safety, will therefore be subject to particular attention.

THE STRATEGIC ACTION PLAN shall run for a period of 5 years from its date of signing and be updated each year.

Its scope shall take in the following:

- the general strategy of the SSP as laid down by the Direction General of the French Civil Aviation Authority (DGAC);
- the annual safety report published by the ministry responsible for civil aviation in France; and

- the work of the DGAC in partnership with operators on identifying risks in the air transport sector.

Incorporating the strategic aims of the DGAC, **THE STRATEGIC ACTION PLAN OF THE SSP** lays down objectives that fall into two categories:

- general objectives, which are concerned with reducing a number of risks across the board; and
- specific objectives, when the aim is to reduce the frequency or seriousness of a particular, targeted risk.

All persons involved in air transport safety are invited to read this document, to take note of the parts which concern them, and to contribute to its improvement.

The DGAC has also added to this strategic action plan a risk portfolio for the express purpose of identifying the priorities required for dealing with particular safety event types. This portfolio employs the following ideas and terminology: danger, risk, undesirable event (UE) and feared consequence (FC).

These terms are in familiar use in various industries, including aviation, but may have different accepted meanings both nationally and internationally.

For the purposes of the French state safety programme, we have adopted the following meanings:

- a feared consequence is an accident, the ultimate consequence of a series of events as defined in the ICAO's Annexe 13; and

- an undesirable event is an event which was not intended as part of the expected service.

An undesirable event can be of a technical, procedural or human nature.

In the DGAC's analysis, which is similar to the “bow-tie” model, feared consequences are placed on the right and undesirable events in the centre.

Purposes of the SSP

SSP-P1 Safety culture

Establish a safety culture in all of the DGAC's activities to bring about effective aviation safety management, based on feedback and experience, and to make safety paramount at all times. The mindset of a safety culture consists of assessing each action in terms of how it improves safety and, if need be, challenging it or reinforcing it.



SSP-P7 Oversight and regulation

Develop and optimize oversight methods and regulatory activities so that they comply with the new requirement for operator SMSs.



SSP-P8 Partnership with the operators

Encourage the active participation of operators in areas such as improving regulations, monitoring the industry, promoting safety and identifying priority areas to improve safety.

SSP-P9 Foreign airlines

Carry out safety checks on foreign airlines with a view to ensuring a standardized level of safety within the scope of EC regulations.



SSP-P2 Continuous safety improvement processes in the DGAC

Set up processes for continuous safety improvement (CSI) in all of the DGAC's departments concerned with the safety management system (SMS) with a view to optimizing their work. These processes include identifying the risks and dangers, defining the indicators, putting together the necessary corrective or proactive measures, and monitoring their implementation and effectiveness.

SSP-P3 Promoting SMSs

Encourage operators to implement safety management systems (SMS) and CSI processes for all their activities which are subject to risk.

SSP-P4 Risk initiatives

Adopt initiatives, in partnership with operators and the BEA, which focus on identifying and quantifying risks.

SSP-P5 Safety data

Set up, as part of a proactive approach, systems for collecting safety-related data and make those available to all the bodies concerned.

SSP-P6 Safety Performance

Use the objectives defined in the strategic action plan as the benchmarks for measuring safety performance.

SSP-P10 Implementation problems

Identify the problems arising from the implementation of regulations (including routine breaches of regulations or repeated requests for special dispensations) and determine corrective actions, either by proposing changes to the rules or by changing oversight methods and sanctions.

SSP-P11 Resources

Make the regulatory duties which offer the best return in terms of safety the priority when it comes to allocating national resources.

SSP-P12 Training

Put together modules which may be integrated into training courses to explain the principles of the state safety programme, promote the idea of a 'safety culture' and the processes involved, and raise awareness of the role all of us must play if we are to ensure the programme's success.



SSP-P13 Information and qualifications

Ensure that all DGAC staff involved in safety matters in aviation receive the necessary information with which to carry out their duties, are competent in their particular field, and are assigned to tasks which match their abilities.



Reducing general risks (GR)

Part of the aim of the strategic plan is to reduce the risks which affect aviation as a whole and this concerns the DGAC and the operators in equal measure. It specifies the actions to be performed in line with the purposes of the SSP.

SSP-GR/09/1 Operators must implement effective SMSs

Safety management systems are or will be made compulsory for the majority of operators. Each company will have to set up its own system and demonstrate its effectiveness.

The DGAC shall make available the necessary tools and systems that operators need to tailor the SMS to the hazards and organization of their own activities (P3).

The DGAC will insist on the following points:

1. That all persons involved take on board the spirit of the initiative (the DGAC must help companies understand why an SMS is necessary) and that company leaders show real commitment;
2. That operators contribute actively to improving the identification of air transport risks and, in particular, understanding new risks (P4 and P8); and
3. That processes for identifying hazards and managing risks are applied throughout the industry and include an effective incident management process (P4).

SSP-GR/09/2 Set up an organized and effective state safety programme

The DGAC and its partners (BEA and GSAC) must provide an all-inclusive and coherent organization in which to implement the SSP. To do this, the central and regional DGAC offices will implement the following actions:

Risk management:

1. Set up risk management processes in the various DGAC departments involved in the SSP (P2). These processes shall be the product of quality control, when the latter is operational, and integrated into the DGAC's governance mechanisms;
2. Assess the performance (P6) of each identified process in terms of its contribution to safety; and
3. Analyse and develop these processes against the benchmarks of monitoring activities and safety regulations (P1).

Safety data and associated documents:

4. Organize the gathering of safety-related data, assess their coherence and collate them, analyse and summarize the data, and monitor the industry for any new documents published in the field (P5 & P9);
5. Ensure that pertinent documents relating to measuring safety are communicated to all the appropriate DGAC personnel via the DGAC's intranet and to operators through the DGAC website (P5 & P13); and
6. Contribute to the annual safety report and provide regular updates on risks identified in the air transport industry (P4 & P6).

Managing personnel and skills (P11 and P13):

7. Steer positions, profiles and skills (particularly in the context of manpower planning) towards regulatory and oversight initiatives which contribute the most to improving safety, and feed this data into the human resources management process; and
8. Arbitrate on matters relating to the opening and filling of positions so that the DGAC's activities for improving safety are more effective.



Training (P12):

9. Develop the services provided by the ENAC (Ecole Nationale de l'Aviation Civile) to comply with the requirements of the SSP;
10. Define the training modules which need to be included in initial and subsequent training as well as in integration sessions;
11. Develop training materials for each of these modules or adapt those currently used in other countries;
12. Organize a conference every year in each major DGAC office for the purpose of communicating information to personnel.

SSP-GR/09/3 Limit the risks associated with the interfaces between the various systems run by operators

The interfaces between personnel and technical systems of operators with different vocations are generally less robust in terms of safety than the in-house systems and procedures of an operator itself.

Moreover, recent experience has shown that these interfaces are often a factor in the causes of accidents. Of the various interfaces we can highlight the following:

- aircraft manufacturers/airlines/maintenance organisations;
- airports/airlines/air traffic management (ATM); and
- specialist and qualified contractors in the subcontracting chain.

As part of their safety management system, companies should pay particular attention to both managing changes which affect the interfaces and to any drift in procedures which may generate incidents. They should also set up common working structures to identify potential risk-reducing initiatives.



The scope of these initiatives may be local in character but they could lead to the implementation of new safety-related measures such as the Minimum Safe Altitude Warning (MSAW) system, stop bars or the Airborne Collision Avoidance System (ACAS).

The DGAC will be paying close attention to these interfaces, particularly during the implementation of P3, P4 and P5.

SSP-GR/09/4 Make effective safety measures the priority when regulating and monitoring the air transport industry

Regulation is one of the tools available to the State for improving safety. The aim of regulations and their associated procedures is to establish specific requirements whose purpose it is to eliminate known hazards.

However it is generally assumed, without it necessarily being the case, that operators understand these rules, take them on board and apply them effectively. This is why the decision to establish or modify a rule must be taken with care and after exploring other ways of improving safety.

To ensure the development of the regulations, in accordance with P10 and within the limits imposed by international bodies, the DGAC shall:

1. Establish new approaches to real, perceived and acceptable risks; and
2. Wherever possible, assess the safety impact of a regulation through risk-benefit and cost-benefit analyses of the various scenarios.



Similarly for oversight activities the DGAC, in accordance with P7, shall:

3. Carry out oversight actions targeted on known areas of high risk by pinpointing the most pertinent safety regulations;
4. Propose changes in the regulations when the results of audits seem to require them (P8);
5. Channel oversight activities so as to discern the effectiveness of SMSs and in particular the progress made by operators, the monitoring of this progress and the assessment of its effectiveness in accordance with the requirements of the operator's in-house SMS (P3); and
6. Adapt oversight activities to the maturity of the operator's in-house SMS.

SSP-GR/09/5 Improve expertise and training in dealing with human factors

The impact of human factors on safety level is recognized across the air transport industry as being significant. Regular training in Crew Resource Management (CRM) for pilots and Team Resource Management (TRM) for air traffic controllers is the main method in use today for reducing such risks.

Efforts to gain a better understanding of human factors, not only on an individual level but also (and in particular) in organizations as a whole, can only progress if we:

1. Use the experience acquired in CRM and TRM training courses to optimize their effectiveness as a risk-managing tool within the safety management system;
2. Introduce training for management which will raise awareness of the human factors and organizational aspects of operational decisions;

SSP-GR/09/6 Identify the reasons for and react to any deliberate breach of the rules or routine deviation from procedures

Certain types of routine deviation or deliberate rule-breaking can be identified through the analysis of incidents and information collected from those involved. Whether they be considered as providing some operational advantage or constitute an unprofessional act is not the point; the fact that they are an unknown factor renders any safety process less reliable.

In order to reduce the risks arising from rule-breaking (P10) the DGAC recommends that it is necessary to:

1. Officially identify the principal instances of routine deviation or

3. Encourage the setting up of systems for allowing anonymous comments to be made about normal operational situations (based on the Line Operations Safety Audit (LOSA) methods for pilots, and the Normal Operations Safety Survey (NOSS) for controllers), to pinpoint more effectively the operational constraints which lead to procedures being modified and uncontrolled risks; and
4. Set up a network of excellence to promote best practice in dealing with human factors, encourage companies, operators and researchers to talk to each other, and facilitate the exchange of ideas with other high-risk industries.



SSP-GR/09/7

Contributing to a strategic plan for improving air safety in Europe

The actions required to further the purposes listed above have, in general, a European side to them; therefore it is logical for the French SSP to contribute to the progressive implementation of a strategic action plan for improving air safety at a European level in accordance with, wherever possible, the actions of the ICAO and the stated purposes of the national action plan.

The actions required to do this include:

1. Distributing this strategic action plan to the relevant European bodies and suggesting to them the setting up a European plan; and
2. Asking the stakeholders (DGAC and operators representatives) who liaise with these bodies to support the establishment of a European plan.



Reducing specific risks (SR)

The objectives in this part of the strategic plan involve reducing specific risks that are considered at the current time to have the greatest potential for improving safety. They are the result of issues brought to light by the DGAC's risk management process and a panel of experts. This approach requires the DGAC to focus on actions which will bring about safety improvements in very specific areas; however it must not have an adverse effect on the DGAC's risk management process or other initiatives for improving safety.

SSP-SR/09/1 Reducing the number of unstabilised approaches and limit the seriousness of any consequences of such an undesirable event

Reducing the number of unstabilised approaches and limit the seriousness of any consequences of such an undesirable event.

The DGAC has observed that unstabilised approaches are the root cause of a significant number of accidents, whether they be collisions with the ground or runway excursions. In 2006 the DGAC drew

up an action plan to look at this issue. In order to continue the work already done on reducing the number of unstabilised approaches the DGAC recommends to:

- work more closely with French operators to quantify the most serious incidents of this kind and set precise targets for reducing these events;

- encourage foreign airlines operating in France to participate in the action plan;
- lobby for this activity to be adopted at a European level; and
- assess the effectiveness of the action plan which was set up at the end of 2006.

SSP-SR/09/2 Reducing the number of runway incursions and limiting the seriousness of any consequences of such an undesirable event

The DGAC, like Eurocontrol, has observed that runway incursions are a major risk for airports and work carried out in 2007 resulted in a conference on the subject.

In order to improve the prevention of runway incursions the DGAC recommends to:

- define pertinent indicators and targets for reducing runway incursions; and
- establish an action plan for reducing the risks linked to runway incursions in accordance with the European Action Plan for the Prevention of Runway Incursions (EAPPRI) and the actions already implemented by the DGAC in this area.



SSP-SR/09/3 Reducing the risks linked to aircraft loading errors and entering data into the Flight Management System (FMS)

Numerous incidents occurring in France over the last few years, some of which were serious, and accidents occurring in other countries show that the risks associated with loading errors are significant.

The DGAC recommends to:

- define the relevant tools for measuring these risks and set targets for reducing them;
- explore ways in which to reduce the risks and work with operators to establish preventive measures; and
- encourage the European Aviation Safety Agency (EASA) to take these risks into account when certifying aircraft designs.

SSP-SR/09/4 Improving assistance to crews making decisions in hazardous weather conditions

A review of recent accidents and serious incidents has shown that certain pieces of information affecting decision-making and linked to safety issues are not always available to crews when needed. To reduce the risks associated with hazardous meteorological phenomena (excluding icing, which is the subject of a specific objective), the DGAC recommends to:

- identify and prioritize the various risks linked to hazardous meteorological phenomena;
- identify common failure modes; and

- define, for a given failure mode, the relevant tools for measuring its level of risk, set objectives for reducing this risk and establish action plans. Some of these actions should focus on the practical details of deciding when to execute a missed approach and the relevant information leading to a missed-approach decision.

SSP-SR/09/5 Reducing risks linked to icing



Recurrent incidents and accidents caused by icing, as well as the conclusions of a conference held in 2008, show that awareness of icing risks and de-icing operations can be improved for all bodies involved. The DGAC recommends to:

- define the relevant tools for measuring risks linked to anti-icing and de-icing operations on the ground and icing in flight;
- raise awareness of the risks among all the personnel involved; and
- if the need be, establish an action plan.

SSP-SR/09/6 Limiting the risks linked to airport works

Serious incidents linked to works at airports have been identified in France. The DGAC recommends to:

- inventory and prioritize incidents linked to works or maintenance at airports;
- improve, if necessary, procedures linked to scheduling and managing works and maintenance at airports; and

- improve the presentation of the relevant details so as to give crews the information they need in order to anticipate risks generated by errors (routing, runway incursions etc.).



Risk portfolio for the commercial air transport industry

This diagram shows the risk portfolio compiled by the DGAC for the purposes of the SSP and does not prejudice similar risk portfolios compiled by operators. The portfolio uses the following terminology:

- a feared consequence (FC) is the ultimate consequence of a series of events as defined in the ICAO's Annexe 13; and
- an undesirable event (UE) is an event which was not intended as part of the expected service. An undesirable event can be of a technical, procedural or human nature.

In the DGAC's analysis, which is similar to the "bow-tie" model, feared consequences are placed on the right and undesirable events in the centre.

KEY

- FC1** CFIT
- FC2** Crash after loss of control in flight
- FC3** Mid-air collision
- FC4** Collision on the ground (high speed)
- FC5** Runway excursions
- FC6** Material damage or injury in flight
- FC7** Material damage or injury on the ground
- UE** Risk-reducing activity of the DGAC given the highest priority
- UE** Risk must be subjected to a DGAC action plan for reducing risks
- UE** Risk monitored under the terms of the SSP
- UE** Risk subject to statistical monitoring under the terms of the SSP
- FC** Colour code depends on the seriousness of the accident
- X** The UE generates a significant increase in the likelihood of an FC occurring
- #** The UE could, in exceptional circumstances, develop into an FC

The work of managing risks under the SSP focuses on undesirable events (UE): the aim is to limit both the occurrence of undesirable events and prevent undesirable events from developing into feared consequence (FC).

It should be noted that the links between UE and FC are quantifiable in terms of how frequently a UE occurs and its seriousness (which corresponds to the likelihood of a UE developing into an FC). In this portfolio, only these links are shown: by a cross (X) if the UE leads to a significant increase in the probability of an FC occurring and by a hash sign (#) if the link is rare but proven. The overall risk of a UE is quantified by the product of its frequency and its seriousness. The estimated overall risk of a given UE is indicated by its colour code.

■ **For UE coded yellow:** the DGAC considers that the risk is eliminated by equipment design or sufficiently effective procedures as long as its frequency complies with design criteria. Thus, these kinds of UE are only monitored statistically in order to verify that they remain within predefined limits. For example, engine failure in a multi-engined aircraft is normally in this category since the aircraft is designed to fly under these conditions and the crews are specifically trained for such an eventuality.

■ **For UE coded orange:** a certain number of events show that a system involving the aircraft, crew or external interfaces can develop in a way that was not necessarily taken into account when designing the system. The associated risk is considered to be under control; however close attention is paid to any such events. Corrective actions are generally isolated and carried out by operators. The DGAC monitors the effectiveness of these actions and intervenes if necessary. For example, loss of separation in flight would be included in this category.

■ **For UE coded red:** when the frequency and severity of the risk seem to exceed acceptable limits (and particularly in the event of a strong correlation between some of these incidents and accidents analysed in investigation reports) the UE is subject to specific work by the DGAC. The purpose of the work undertaken by the DGAC is to define and implement actions for reducing risks which complement those set up by operators on their own initiative. The character of these actions could be to inform, encourage or to implement regulations. The work and publications by the DGAC on UE relating to unstabilised approaches and runway incursions are good examples of the authority's approach to these potential events.

N°	Identification of the undesirable event	FC1	FC2	FC3	FC4	FC5	FC6	FC7
UE01	Unstabilised approaches	X	#			X		X
UE02	Loading error and entry of erroneous data into the FMS		X			X	X	X
UE03	Runway incursions				X	X		X
UE04	Incident linked to icing or de-icing procedures		X			X	X	X
UE05	Encounters with hazardous weather conditions (thunderstorms, wind shear)		X			X	X	X
UE06	Engine failure on a multi-engined aircraft		X			X	X	X
UE07	Loss of cabin pressure		X				X	
UE08	Deviation from flight path	X		X			X	
UE09	Loss of separation in flight			X			X	
UE10	Inappropriate action by crew (human factors, regulations)	X	X	X	X	X	X	X
UE11	Failure of air-ground interfaces (general)	X	#	X	X	X	X	X
UE12	Incidents linked to a contaminated runway in use					X		X
UE13	Failure of an aircraft system (excluding single engine failure, loss of pressure or reverse thrust failure)	#	X	#	#	X	X	X
UE14	Fire or smoke		X			#	X	X
UE15	Failure of reverse thrust system		X			X	X	X
E116	Incidents linked to airport maintenance or works	#			X	X		X
UE17	Incident linked to a maintenance issue	X	X	#	#	X	X	X

The list of UE is based on incidents and analyses communicated to the DGAC by operators and investigations and research performed by the BEA and the similar organizations of other countries. The list is not exhaustive and will change every year when the strategic plan is updated after consultation with operators.

Contact details

Georges WELTERLIN

*French Civil Aviation Authority,
Civil Aviation safety directorate,
Safety management coordination office*

50 rue Henry Farman
75720 Paris cedex 15

Telephone: +33 (0)1 58 09 47 23

Fax: + 33 (0)1 58 09 43 38

georges.welterlin@aviation-civile.gouv.fr

Communication and public relations officer for the DSAC:

Yannick ROBERT

Printed by: PRINTER

Graphic design: Kazoar

Photo credits:

© STAC picture library

© STBA picture library

© STAC/Graphix picture library

Alexandre PARINGAUX,

Véronique PAUL,

Gabrielle VOINOT,

Marie-Ange FROISSART,

Richard METZGER,

Jocelyne ALVAREZ.

Ressources, territoires et habitats
Énergie et climat
Prévention des risques
Développement durable
Infrastructures, transports et mer

**Présent
pour
l'avenir**



Direction générale
de l'Aviation civile
50, rue Henry Farman
75720 Paris cedex 15
Tél. 33 (0)1 58 09 43 21